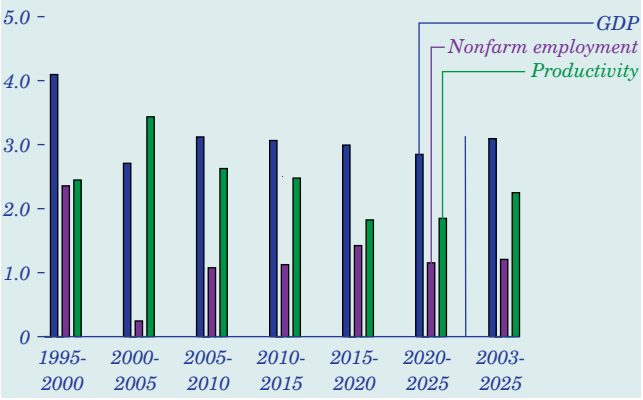
Strong Economic Growth Is Expected To Continue

Figure 35. Average annual growth rates of real GDP and economic factors, 1995-2025 (percent)



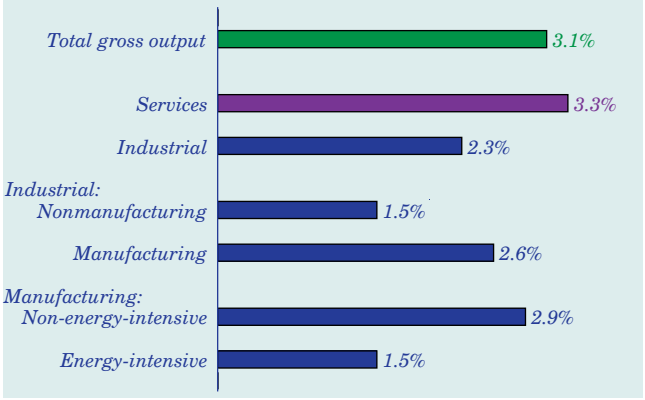
The output of the Nation's economy, measured by GDP, is projected to grow by 3.1 percent per year between 2003 and 2025 (with GDP based on 2000 chain-weighted dollars) (Figure 35). The labor force is projected to increase by 0.9 percent per year between 2003 and 2025. Labor productivity growth in the nonfarm business sector is projected at 2.2 percent per year.

Compared with the second half of the 1990s, the rates of growth in GDP and nonfarm employment were lower from 2000 through 2002. Economic growth has been more robust since 2003. Real GDP growth was 3.0 percent in 2003 and is expected to be 4.4 percent in 2004. The economy is expected to stabilize at its long-term growth path between 2005 and 2010. Total population growth (including armed forces overseas) is expected to remain fairly constant after 2003, growing by 0.8 percent per year on average. Labor force growth is expected to slow as a result of demographic changes, but more people over 65 are expected to remain in the work force. Nonfarm business productivity growth has been strong recently, averaging 3.8 percent per year from 2000 to 2003. Productivity growth from 2003 to 2025 is expected to average more than 2 percent per year, supported by investment growth of 5.1 percent per year.

From 2003 through 2025, disposable income is projected to grow by 3.1 percent per year and disposable income per capita by 2.2 percent per year. Nonfarm employment is projected to grow by 1.2 percent per year, and employment in manufacturing is projected to shrink by 0.6 percent per year.

Service Sectors Lead Output Growth, Industrial Output Growth Is Slower

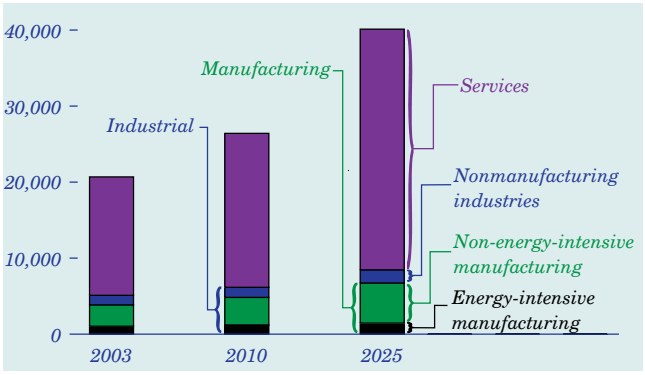
Figure 36. Sectoral composition of output growth rates, 2003-2025 (percent per year)



From 2003 to 2025, industrial output in real value terms is projected to grow by 2.3 percent per year, compared with 3.3-percent average annual growth in the services sector (Figure 36). Manufacturing output is projected to grow by 2.6 percent per year and nonmanufacturing output (agriculture, mining, and construction) by 1.5 percent per year. The energy-intensive manufacturing sectors [*129*] are expected to grow more slowly (1.5 percent a year) than the non-energy-intensive manufacturing sectors (2.9 percent per year).

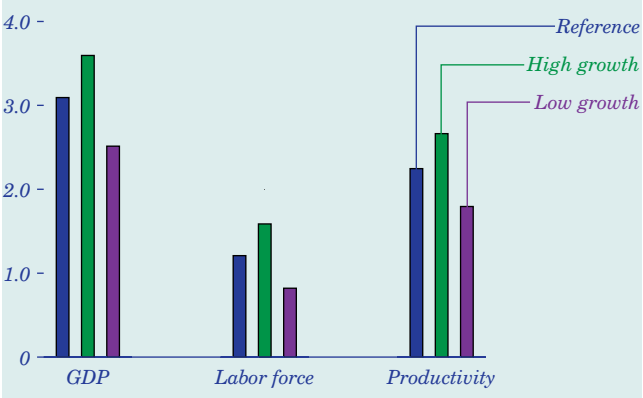
In *AEO2005*, the sectoral classification of the value of industrial output has been changed. In addition, the definition of services has been expanded to include the cost of goods in the wholesale and retail sectors. The industrial sector's share of total output is expected to fall from 25 percent in 2003 to 21 percent in 2025, and the manufacturing share of total output is projected to fall from 19 percent in 2003 to 17 percent in 2025 (Figure 37).

Figure 37. Sectoral composition of gross output, 2003, 2010, and 2025 (billion 1996 dollars)



High and Low Growth Cases Reflect Uncertainty of Economic Growth

Figure 38. Average annual real growth rates of economic factors in three cases, 2003-2025 (percent)



To reflect the uncertainty in forecasts of economic growth, *AEO2005* includes high and low economic growth cases in addition to the reference case (Figure 38). The high and low growth cases are intended to show the projected effects of alternative growth assumptions on energy markets. Economic variables in the alternative cases—including GDP and its components, disposable income, interest rates, productivity, population, prices, wages, and employment—are modified, in a consistent framework, from those in the reference case.

The high economic growth case assumes higher projected growth rates for population (1.0 percent per year), nonfarm employment (1.6 percent per year), and productivity (2.7 percent per year) from 2003 through 2025. With higher productivity gains and employment growth, inflation and interest rates are projected to be lower than in the reference case, and economic output is projected to grow at a higher rate (3.6 percent per year) than in the reference case (3.1 percent). GDP per capita is expected to grow by 2.5 percent per year, compared with 2.2 percent in the reference case.

The low economic growth case assumes lower growth rates for population (0.6 percent per year), nonfarm employment (0.8 percent per year), and productivity (1.8 percent per year), resulting in higher projections for prices and interest rates and lower projections for industrial output growth. In the low growth case, economic output is projected to increase by 2.5 percent per year from 2003 through 2025, and growth in GDP per capita is projected to average only 1.9 percent per year.

Long-Run Trend Shows U.S. Economic Growth of About 3 Percent per Year

Figure 39. Average annual real GDP growth rate, 1970-2025 (percent, 22-year moving average)

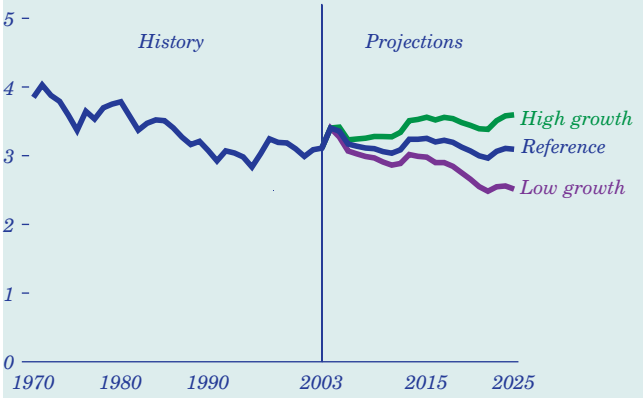
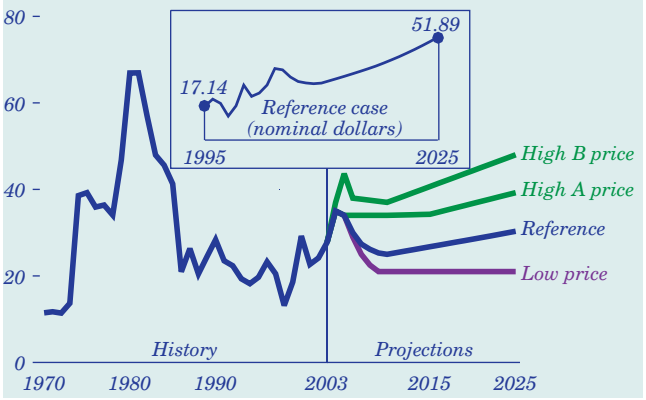


Figure 39 shows the trend in the 22-year moving average annual real growth rate for GDP, including projections for the three *AEO2005* cases. The value for each year is calculated as the annual compound growth rate over the preceding 22 years. The 22-year average shows major long-term trends in GDP growth by smoothing out the more volatile year-to-year changes (although periods that start or end in recession years can show more volatile changes in the growth rate). Annual real GDP growth has fluctuated considerably around the trend. The high and low growth cases capture the possibility of different paths for long-term output growth.

One reason for the variability of the forecasts is the composition of economic output, reflected by real growth rates of consumption and investment relative to overall GDP growth over the 2003-2025 period. In the reference case, consumption is projected to grow by 2.7 percent per year, while investment grows at a 5.1-percent annual rate. In the high growth case, with relatively lower interest rates, growth in investment is projected to average 5.8 percent per year. Higher investment rates lead to faster capital accumulation and higher productivity gains, which, combined with higher labor force growth, yield higher aggregate economic growth than projected in the reference case. In the low growth case, with relatively higher interest rates, annual growth in investment expenditures is projected to average only 4.0 percent. Lower investment growth rates imply slower capital accumulation. With the labor force also growing more slowly, aggregate economic growth is expected to be significantly lower than projected in the reference case.

Projections Vary in Cases With Different Oil Price Assumptions

Figure 40. World oil prices in four cases, 1970-2025 (2003 dollars per barrel)

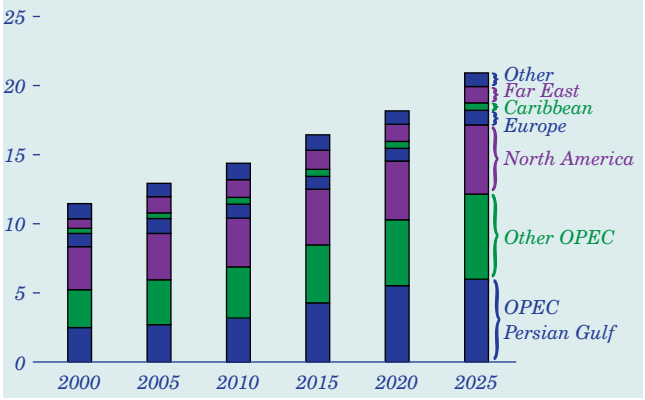


The historical record shows substantial variability in world oil prices, and there is similar uncertainty about future prices. Four *AEO2005* cases with different price paths allow an assessment of alternative views on the future of oil prices (Figure 40). In the reference case, with both OPEC and non-OPEC producers scheduled to add new production capacity over the next 5 years, prices in 2010 are projected to be more than $10 per barrel lower than current prices (all prices in 2003 dollars per barrel). After 2010, oil prices are projected to rise by about 1.3 percent per year, to more than $30 per barrel in 2025. (In nominal dollars, the reference case price is about $52 in 2025.) In the low price case, prices are projected to decline from their high in 2004 to $21 per barrel in 2009 and to remain at that level out to 2025. The high A price case projects that prices will remain at about $34 through 2015 and then increase on average by 1.4 percent per year, to more than $39 per barrel in 2025. In the high B case, world oil prices are projected to fall from current levels to $37 per barrel in 2010 and then rise to $48 per barrel in 2025.

Projected prices in all four cases are higher than in *AEO2004* [*130*], reflecting recent improved production discipline by OPEC members and limited ability of other producers to expand production despite increasing demand and high utilization rates that have led to higher prices. The price projections in the high A and B cases are sufficiently robust to encourage greater market penetration of alternative energy supplies.

Oil Imports Reach More Than 20 Million Barrels per Day by 2025

Figure 41. U.S. gross petroleum imports by source, 2000-2025 (million barrels per day)



Total U.S. gross petroleum imports are projected to increase in the reference case from 12.3 million barrels per day in 2003 to 20.2 million in 2025 (Figure 41). Crude oil accounts for most of the increase in imports, because distillation capacity at U.S. refineries is expected to be more than 5.5 million barrels per day higher in 2025 than it was in 2003. Gross imports of refined petroleum, including refined products, unfinished oils, and blending components, are expected to increase by almost 60 percent from 2003 to 2025.

Crude oil imports from the North Sea are projected to decline gradually as North Sea production ebbs. Significant imports of petroleum from Canada and Mexico are expected to continue, with much of the Canadian contribution coming from the development of its enormous oil sands resource base. West Coast refiners are expected to import small volumes of crude oil from the Far East to replace the declining production of Alaskan crude oil. The Persian Gulf share of total gross petroleum imports, 20.4 percent in 2003, is expected to increase to almost 30 percent in 2025; and the OPEC share of total gross imports, which was 42.1 percent in 2003, is expected to be above 60 percent in 2025.

Most of the increase in refined product imports is projected to come from refiners in the Caribbean Basin, North Africa, and the Middle East, where refining capacity is expected to expand significantly. Vigorous growth in demand for lighter petroleum products in developing countries means that U.S. refiners are likely to import smaller volumes of light, low-sulfur crude oils.